

EXHIBIT B

(PART 1)

June 18, 1929.

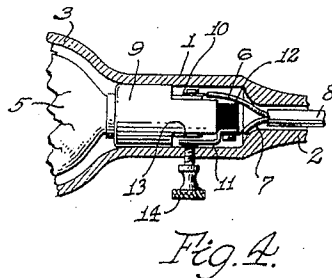
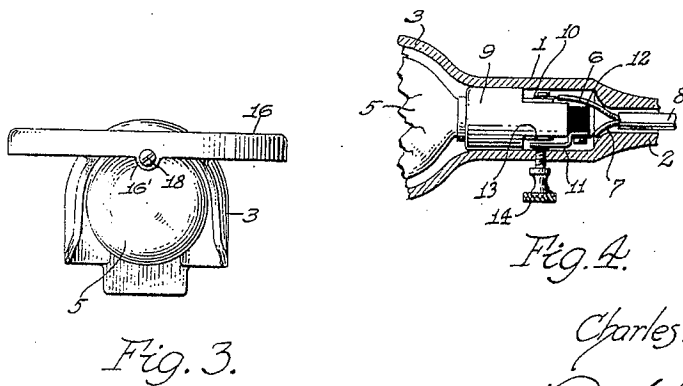
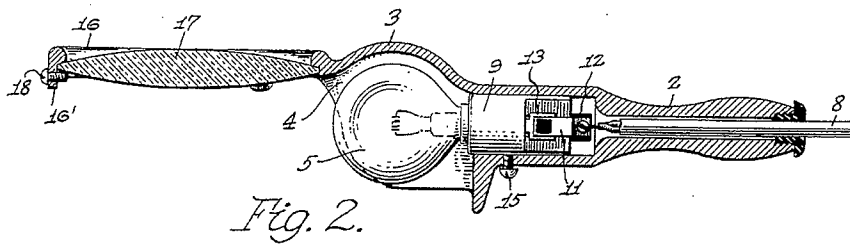
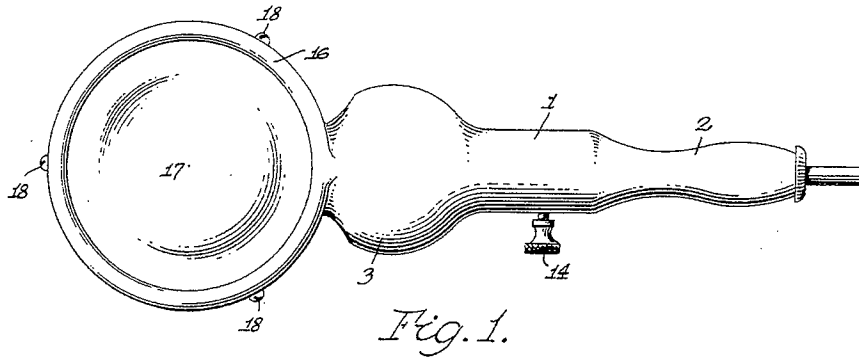
C. T. BRADY

1,717,754

MAGNIFYING AND ILLUMINATING DEVICE

Filed May 31, 1927

2 Sheets-Sheet 1



Inventor

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384

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June 18, 1929.

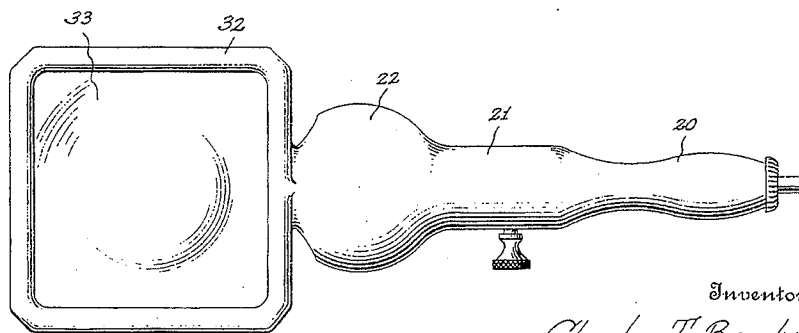
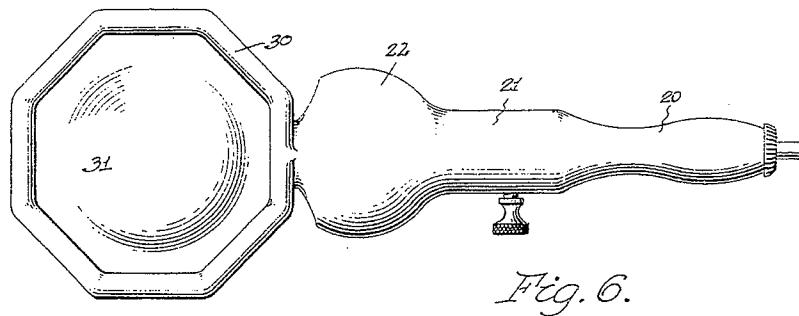
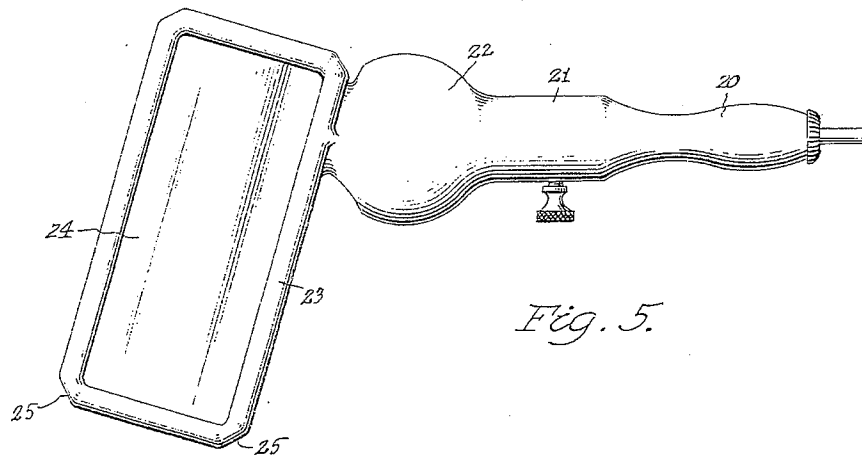
C. T. BRADY

1,717,754

MAGNIFYING AND ILLUMINATING DEVICE

Filed May 31, 1927

2 Sheets-Sheet 2



Inventor

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Patented June 18, 1929.

1,717,754

UNITED STATES PATENT OFFICE.

CHARLES T. BRADY, OF DETROIT, MICHIGAN.

MAGNIFYING AND ILLUMINATING DEVICE.

Application filed May 31, 1927. Serial No. 195,572.

The present invention pertains to a novel magnifying and illuminating device constructed particularly for the examination of objects such as parts of the body, documents, 5 finger prints and the like. The principal object of the invention is to provide a device of this character which will illuminate the object under examination and at the same time magnify it to the eye of the observer.

10 The device comprises essentially a body formed with a lamp socket and a lamp shield having its inner surface treated to function as a reflector. The socket carries a handle by which the device is held, and the shield 15 is formed with a suitable support for a magnifying lens. The arrangement of the several parts is such that the device may be adjusted to focus light on the observer and at the same time bring the reflecting lens in the line of sight from the observer's eye to the object.

The invention is fully disclosed by way of example in the following description and in the accompanying drawings, in which

25 Figure 1 is a plan view of the device;
 Fig. 2 is a longitudinal section thereof;
 Fig. 3 is an end view;
 Fig. 4 is a detail section at right angles to Figure 2; and

30 Figures 5, 6 and 7 are plan views of modified constructions.

Reference to these views will now be made by use of like characters which are employed to designate corresponding parts throughout.

35 The body of the device is formed to provide a socket 1 having at one end a handle 2 and at the other end a shield 3. The body is preferably made of aluminum for lightness, and the inner surface 4 of the shield is preferably of a reflecting nature for cooperation with a lamp 5 fitted into the socket.

A pair of conductors 6 and 7 incased in a protective tubing 8, are passed axially into 45 the handle until reaching the interior of the socket. The plug 9 of the lamp 5 has one of the conductors fixed to a contact 10 thereon. The other conductor 7 has a spring contact 11 fixed to the insulated end 12 of the plug 9 and normally spaced from the second terminal 13 of the plug. A screw 14 threaded through the socket 1 is adapted to move the contact 11 into engagement with the contact 12 and thereby close the circuit through

the lamp when required. The lamp is prevented from turning in the socket by means of a set screw 15 threaded through the wall of the socket and engaging the plug 9.

At the forward or free edge of the shield 3 is formed an integral ring 16 in which is 60 mounted a magnifying lens 17. The ring overlaps the upper surface of the lens as shown in Figure 2, and the lower surface of the lens is engaged by screws 18 passed through a depending flange 16' of the ring. 65

In the use of the device for examination purposes, the circuit to the lamp is closed and the device is arranged to direct light towards the body under examination. The adjustment is such that the shield 3 will be positioned between the lamp and the observer 70 for the double purpose of reflecting light to the object and preventing light rays from directly entering the eyes of the observer. The device may be tilted to bring the magnifying lens 17 in the line of sight from the observer's eye to the object under examination so that the object will be magnified as well as illuminated.

In the modification shown in Figure 5 the 80 handle 20, socket 21 and shield 22 are constructed as in Figures 1, 2, 3 and 4. The lens frame 23 however is of an oblong shape containing an oblong magnifying glass 24 and having its outer corners cut away as at 25. 85 It will also be seen that the handle lies at an obtuse angle to the longitudinal axis of the lens frame. This position of parts renders the glass more easily adjustable to the subject matter which is to be illuminated and 90 read.

The form shown in Figure 6 has an octagonal frame 30 for holding a similarly shaped magnifying lens 32. In Figure 7 the frame 32 is square and contains a square 95 lens 33. In both Figures 6 and 7, the lens frame is symmetrical to the axis of the handle.

Although specific embodiments of the invention has been illustrated and described, it 100 will be understood that various alterations in the details of construction may be made without departing from the scope of the invention as indicated by the appended claims.

What I claim is:—

105 1. A magnifying and illuminating device comprising a lamp socket, a lamp shield and a lens holder all formed of one piece.

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2. A magnifying and illuminating device comprising a lamp socket, a handle and a lamp shield at opposite ends of said socket, and a lens holder carried by said shield, said
5 socket, handle, shield and holder being all of one piece.

comprising a lamp socket, a handle and a lamp shield at opposite ends of the socket, and a lens holder, said socket, handle, shield 10 and lens holder being all of one piece.

In testimony whereof I affix my signature.

3. A magnifying and illuminating device

CHARLES T. BRADY.

Oct. 25, 1932.

I. H. M. BLOCH

1,884,968

COMBINED FLASH LIGHT AND READING GLASS

Filed Jan. 12, 1931

3 Sheets-Sheet 1

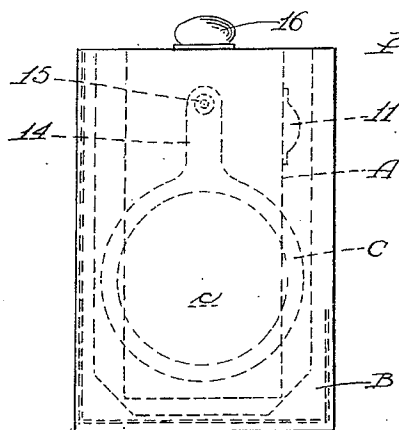


Fig. 1.

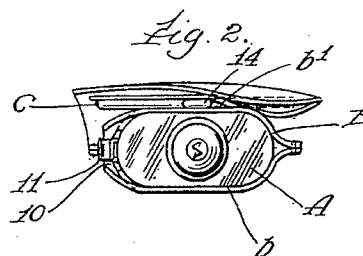


Fig. 2.

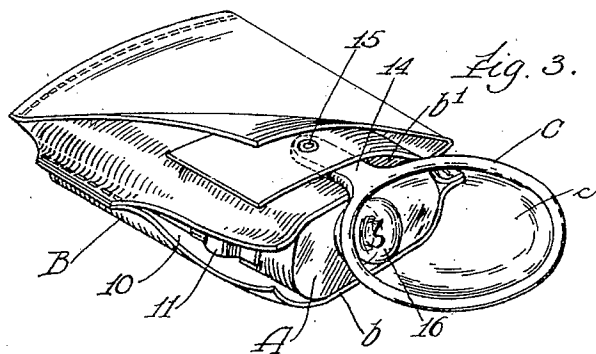


Fig. 3.

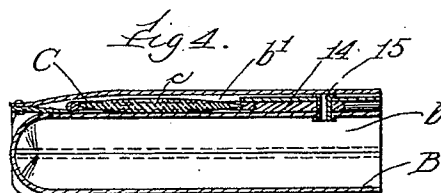


Fig. 4.

Witness
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by Burton Burton
her Attorneys.

Oct. 25, 1932.

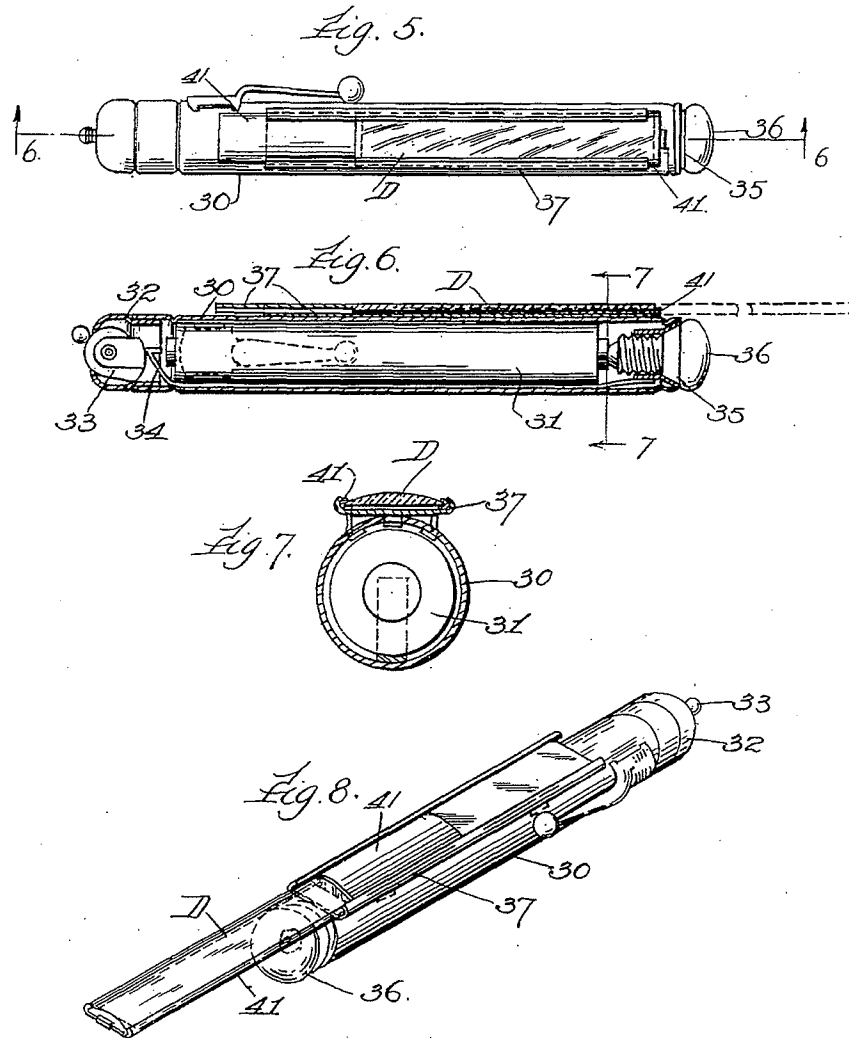
I. H. M. BLOCH

1,884,968

COMBINED FLASH LIGHT AND READING GLASS

Filed Jan. 12, 1931

3 Sheets-Sheet 2



Witness
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Oct. 25, 1932.

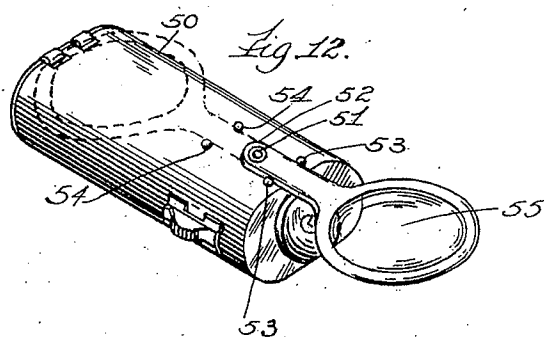
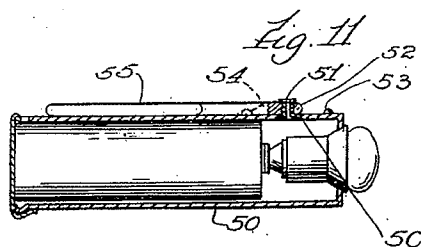
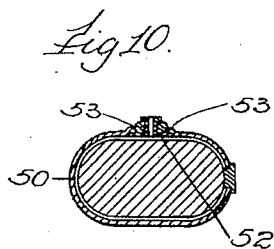
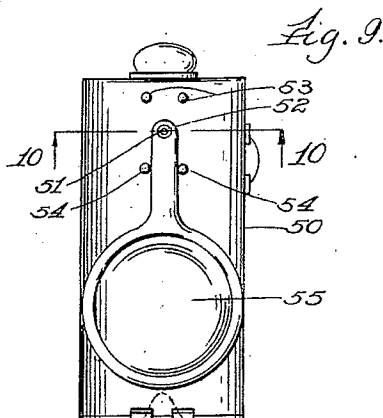
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1,884,968

COMBINED FLASH LIGHT AND READING GLASS

Filed Jan. 12, 1931

3 Sheets-Sheet 3



Witness
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Inventor
Isabelle H. M. Bloch,
by Burton Burton
her Attorneys.

Patented Oct. 25, 1932

1,884,968

UNITED STATES PATENT OFFICE

ISABELLE H. M. BLOCH, OF CHICAGO, ILLINOIS

COMBINED FLASH LIGHT AND READING GLASS

Application filed January 12, 1931. Serial No. 508,159.

The purpose of this invention is to provide in a unitary construction an electric flashlight and a reading glass adapted for illuminating by the light the matter over which the reading glass may be held for magnifying it while thus illuminated. It consists in the elements and features of construction shown and described as indicated in the claims.

10 In the drawings:

Figure 1 is a side elevation of a device embodying this invention in one of its forms.

Figure 2 is a front end elevation of the same.

15 Figure 3 is a perspective view of the same showing the casing partly open to disclose details of interior structure.

Figure 4 is a detail section at the line 4—4 on Figure 3.

20 Figure 5 is a side elevation of another form of the invention.

Figure 6 is a section at the line 6—6 on Figure 5.

25 Figure 7 is a section at the line 7—7 on Figure 6.

Figure 8 is a perspective view of the device with the reading glass extended in position for magnifying the matter illuminated by the light.

30 Figure 9 is a side elevation of a third form of the invention.

Figure 10 is a section at the line 10—10 on Figure 9.

35 Figure 11 is a section of the casing at the line 11—11 on Figure 9 showing the dry cell and the lamp in side elevation.

Figure 12 is a perspective view of the device in this form with the reading glass extended in a position for magnifying the matter on the area illuminated by the lamp.

40 Referring to the form shown in Figures 1 to 4: At A there is shown in entirety a flashlight of familiar form and construction which is telescopically inserted in an open-ended pocket or cell, B, of the casing, B, which is preferably made of flexible material as leather or the like, so as to receive the parts which are to be held in relation to each other, 45 snugly, without requiring mechanical en-

gagement for retaining them in assembled relation, except as hereinafter indicated; but it should be understood that the invention is not limited to the employment of such flexible material for the casing, and on the contrary, such casing may be rigid except as to the folded flaps hereinafter mentioned.

The case, B, has an opening at one lateral edge, as seen at 10 for affording access to the customary switch-operating slide, 11, of the 60 flashlight.

Beside the pocket or cell which accommodates the flashlight unit, the case, B, has a pocket or cell, B¹, alongside the cell, B, for accommodating a reading glass, C, which 65 may be understood to be of familiar form and character, comprising a handle, 14, by which it is pivotally secured to the casing, A, as by an eyelet seen at 15, for swinging into and out of the cell, B¹, said pivot being at 70 suitable position to permit the lens, c, of the reading glass to swing out to a position overhanging the light beam directed from the lens, 16, of the flashlight, the reading glass being designed to extend in a plane parallel 75 to the axis of the lens, 16, of the flashlight when it is swung out of the case, A, to the position indicated.

The case A, may be made with the outer side of the pocket, B¹, formed as a flexible 80 flap which may be flexed outwardly for convenience of manipulating the reading glass in swinging it in and out of its cell.

In the form shown in Figures 5, 6, 7 and 8, 85 the device is made in the form of a slender tube, as of a pocket fountain pen or pencil, the tubular case, 30, serving for receiving a dry cell, 31, arranged to be entered at one end of the tube and retained by a cap, 32, 90 which carries a manually operable cam for operating the switch, 34, by which the circuit connection of the dry cell with the lamp bulb is controlled; and the opposite end of the tube is arranged for holding and stopping 95 in proper position the lamp bulbs, 35, and the beam-directing lens, 36.

The construction as thus far described it will be recognized is similar, in general, to familiar constructions of vest pocket flash- 100

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lights except as to dimensions and form and location of the controlling switch.

The tubular casing, 30, is exteriorly formed at one side with a slideway, 37, for retaining and guiding the enclosing frame, 41, of an oblong reading glass, D, said frame being extended at the inner end beyond the length of the glass to afford a mounting portion which may remain slidably engaged with the guideway, 37, when the lens of the reading glass is thrust out to reading position parallel to and overhanging the light beam projected from the beam-projecting lens of the flashlight.

In the form illustrated in Figures 9, 10, 11 and 12, the flashlight unit is in the familiar form which is shown in Figures 5, 6 and 7, and is arranged with respect to the reading glass so as to dispense with the casing, A, of the form shown in Figures 1 to 4, inclusive, by mounting the reading glass of the form shown in Figures 1 to 4 hingedly on the side of the flashlight body, 50, as by a pivot, 51, positioned at such distance from the opposite ends respectively of said body that the reading glass, 55, may be adjusted about the pivot to out-of-use position as seen in dotted line in Figure 8, lapping on the side of the body and not projecting any substantial distance beyond the handle end of the body; and so that when swung around 180 degrees to the opposite end, the reading glass will extend beyond the light end of the body into proper position for reading the illuminated area.

The body, 50, may be formed with slight outwardly struck bosses, 53, 53, at opposite sides of the pivot of the reading glass, over which bosses the stem, 52, of the reading glass snaps and between which it becomes engaged when it is swung from out-of-use position at which it is seen in dotted line in Figure 12, to position for use shown in full line. A like pair of bosses, 54, 54 may be provided at the rear side of the pivot for engaging the reading glass rim and holding its glass at out-of-use position.

I claim:

1. In combination with an electric flashlight comprising a tubular casing for an energizing dry cell and a lamp bulb and beam-directing means mounted in one end of said casing, an oblong reading glass having its width approximately equal to the diameter of the tubular casing, the casing having at one side a guideway for the reading glass, the latter being arranged for sliding in said guideway from a position alongside the tubular casing to a position lateral with respect to the flashlight beam.

2. The construction defined in Claim 1, the tubular casing having at the end opposite that at which the lamp bulb is mounted a

manually operable switch for controlling the illumination of the lamp.

In testimony whereof, I have hereunto set my hand at Chicago, Ill., this 6th day of January, 1931.

ISABELLE H. M. BLOCH.

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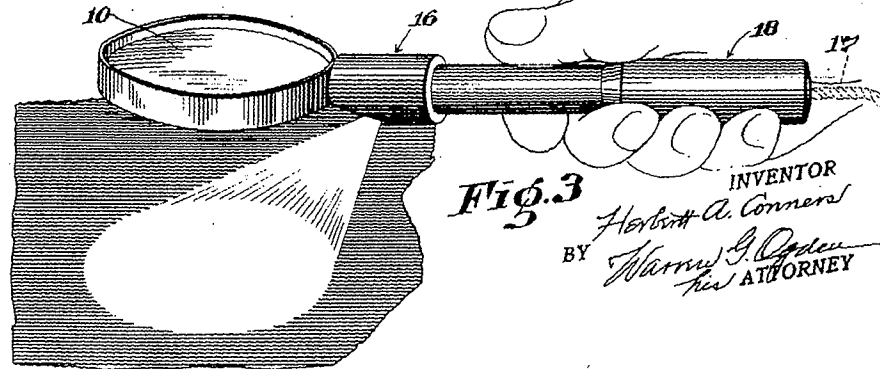
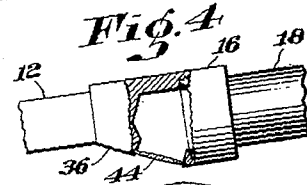
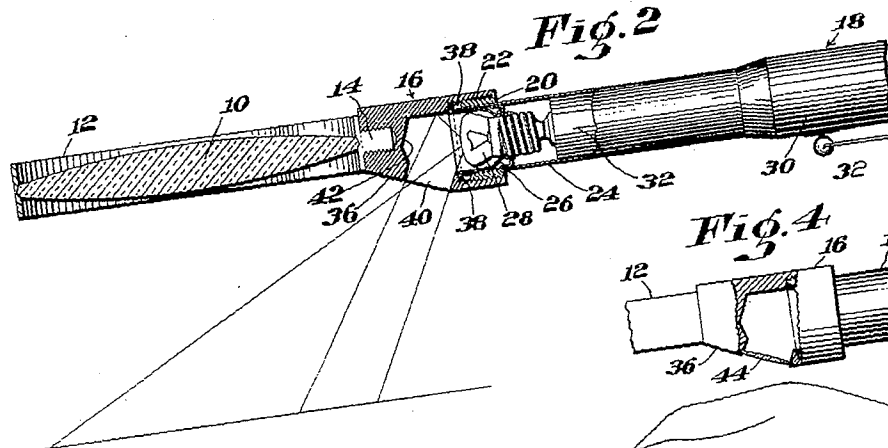
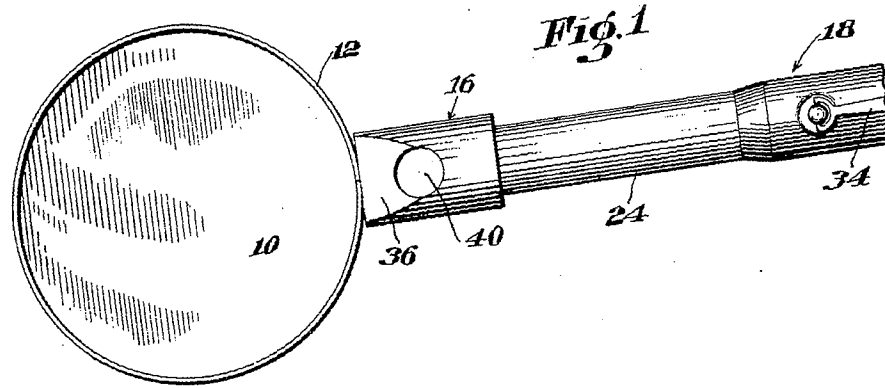
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May 16, 1933.

H. A. CONNERS
MAGNIFYING AND ILLUMINATING DEVICE
Filed March 18, 1931

1,909,662



INVENTOR
Herbert A. Connors
BY *Wm. G. O'Brien*
ATTORNEY

Patented May 16, 1933

1,909,662

UNITED STATES PATENT OFFICE

HERBERT A. CONNERS, OF LEXINGTON, MASSACHUSETTS, ASSIGNOR TO SWIFT & ANDERSON, INC., OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

MAGNIFYING AND ILLUMINATING DEVICE

Application filed March 18, 1931. Serial No. 523,437.

This invention relates to magnifiers and more especially to hand magnifiers or reading glasses provided with a source of illumination to facilitate their use under adverse light conditions or where the material to be examined is minute or of fine or delicate manufacture.

An object of the invention is to combine in one handy structure a magnifying lens and a source of illumination in such form and manner that the light rays will be substantially concentrated beneath the lens and not be broadly dissipated outside the area being examined.

Accordingly a feature of the invention resides in the use of the handle of a reading glass as a container for a battery-energized electric lamp or, if desired, for wires that may lead to an extraneous source of electric power, there being provision for focusing the light rays emanating from the lamp in a manner to create and preserve a field of light of maximum intensity directly below the lens while the magnifier is in use at reading focus.

To the accomplishment of this object and such others as may hereinafter appear, as will readily be understood by those skilled in the art, the invention comprises the features and combinations of parts hereinafter described and then particularly pointed out in the appended claims.

The nature and scope of the invention will be understood from a description of the preferred embodiment thereof illustrated in the accompanying drawing, in which:

Figure 1 is a view, in underside plan, of the illuminating magnifier, the outer end of the handle being broken away;

Fig. 2 is a view, in vertical longitudinal section through the lens and lamp socket, the handle being shown broken as in Fig. 1;

Fig. 3 is a view, in perspective, illustrating the field of maximum illumination beneath the lens, and

Fig. 4 is a fragmentary view, in elevation, of the frame-block broken away about the light opening to show how an auxiliary, concentrating lens may be fitted therein.

In the embodiment of the invention illus-

trated in the drawing the magnifier comprises a lens 10 held within a split ring-frame 12 having a split screw 14 (Fig. 2) for threading in a socket in a frame block 16. In the ordinary magnifier for use with an extraneous source of power the frame block would be a part of, or connected to, a hollow handle through which conductors 17 may lead as indicated on Fig. 3. In this invention the handle 18 preferably comprises a tubular flash light of the "Everready" or other convenient make of a suitable size and is mounted on the frame block by applying an externally threaded collar 20 (Fig. 2) at the lamp end by means of which the handle may be screwed into an internally threaded socket 22 formed in the frame block.

The handle, when formed by a flash light, consists of a tube 24 having an internal fitting such as a helical flange near one end, into which a reflector cup 26 containing an electric light bulb 28 may be screwed, and a cap 30 at its other end. A dry cell battery 32 within the handle is maintained by the cap in contact with the bulb stem, and a spring bar 34 carries a ball, operating through a hole in the cap, to close the circuit when the bar is pressed inward.

It is important that the field of illumination provided by the lamp be substantially concentrated, or at its maximum, just beneath the lens 10 when held at reading focus above the material to be examined. A dissipation of the light over a more widely spread area than that which is under magnification, or a much greater intensity at one side, detracts to a material extent from the usefulness of a device of this character in that the material is displayed under adverse rather than improved lighting conditions. For perfection of lighting conditions a nicety of adjustment of the lamp to the lens and control of the light rays is required. The arrangement of the parts in the matter of both relative location of its parts and control of the direction of the beams to secure the desired "spotting" on the material of the lighted area will now be described.

The frame block 16 preferably, but not necessarily, is cylindrical at its outer or

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handle-receiving end and is slabbed off at the lower side of its inner end downwardly and outwardly from the lens. This produces a face 36 that is inclined to the plane of the lens, an inclination of about 20° having been found, in practice, to give the best results. The frame block is drilled centrally from its outer end for about two thirds of its length (see Fig. 2) the diameter of the bore being substantially the inside diameter of the flash light tube 24. This bore is counterbored and internally threaded to form the handle socket 22 heretofore referred to. As a result of these operations the socket 22 has an outwardly facing, internal shoulder 38 at its base. The shoulder 38, for best results, is just outward of the outer end of the flat under wall formed by the face 36. A circular light outlet 40 is drilled through the flat wall, the drill preferably being held normal to the plane of its face 36 and so centered that the outer edge of the opening thus formed is just inside or back of the shoulder 38 (see Fig. 2). The two drillings, one axially of the frame block and one at an angle of substantially 70° to said axis produce a hood having side walls closed by a forward wall 42 which overhangs or is directly opposite the light bulb and at the inner edge of the intervening light outlet 40. The interior surfaces of the hood may be used as a reflector. When the handle is screwed, by its threaded collar 20, into the outer end, or socket 22, of the axial bore in the frame block, the beaded edge of the reflector 26 seats against the shoulder 38 thus locating the filament of the light bulb just outward of the light opening 40. This construction provides for a hooded lamp with the radiation of its light rays being confined to a downward and forward direction through the downwardly and forwardly inclined passage or light opening 40 in the under wall of the frame block.

The fainter horizontal line in Fig. 2 indicates the surface of some material to be examined, spaced from the lens 10 at a normal reading focus. The fainter oblique lines indicate the main direct and reflected light rays from the lamp and show graphically how the hood controls the projection of the beams of light and confines the more intense portion of the illuminated area to that portion of the reading surface which is magnified by the lens 10. Fig. 3 shows, in perspective, that which has just been described as being shown graphically by Fig. 2, except that the drawing shows a somewhat sharper demarcation between light and darkness than is true in practice.

Figure 4 shows a slight modification. For some kinds of work for which the device may be used it is found desirable to still further concentrate the light rays upon the magnified area of the reading surface. To effect this a lens 44, having its faces ground to the

proper shape for gathering the light rays from within the hood and then directing them to a preselected area beneath the lens 10, may be mounted in a seat formed at the lower edge of the light outlet 40.

The nature and scope of the present invention having been indicated and its preferred embodiments having been specifically described, what is claimed as new is:—

1. An illuminating reading glass comprising a lens and handle therefor substantially in the same plane, a light bulb in the handle, and means intermediate the lens and the bulb constituting an open bottomed opaque enclosing light ray chamber constructed to confine and direct the light rays through said open bottom substantially as a cone of light to a field substantially below the lens when held at reading focus from the material to be examined.

2. An illuminating reading glass comprising a cylindrical frame block constituting an enclosing opaque light ray chamber adapted to project the light rays as a cone of light and having one end slabbed off forming a flat face, an axial bore open at its other end but having a solid portion at its slabbed end and a light outlet in the wall formed by said flat face communicating with said bore, a lens so mounted on said solid end that the plane of said flat face is inclined to the plane of the lens, and a handle containing a light bulb at its inner end mounted in the outer end of said bore with said bulb outward of the light outlet.

3. An illuminating reading glass according to claim 2 in which the said axial bore is provided with an outwardly facing internal shoulder limiting entry of the handle in said bore and determining the relation of the light bulb to the light outlet.

4. An illuminating reading glass according to claim 2 in which the light outlet is circular and a lens is seated therein.

5. A frame block constituting an enclosing opaque light ray chamber adapted to project the light rays as a cone of light for illuminating reading glasses adapted to have a lens and a handle connected to opposite ends thereof comprising a member that is hollow for a considerable part of its length being solid at the lens end and open at the handle end, and having a passage through its wall communicating with the hollow interior, the direction of said passage being inclined toward the lens end of said member.

6. A frame block constituting an enclosing opaque light ray chamber adapted to project the light rays as a cone of light for illuminating reading glasses according to claim 5 in which the hollow member consists of a cylinder axially bored from the handle end and having its lens end slabbed off forming a flat face inclined to the axis of the cylinder, and said inclined passage is through the wall

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formed by said flat face and normal to the plane thereof.

7. In an illuminating reading glass, a lens seated in a lens ring, a hollow frame block constituting an enclosing opaque light ray chamber adapted to project the light rays as a cone of light and having one solid end to which said lens ring is secured and one open end adapted to receive a handle containing a source of illumination, said frame block also having a light outlet passage through its under wall the direction of which is inclined to the plane of said lens.

In testimony whereof I affix my signature.
HERBERTT A. CONNERS.

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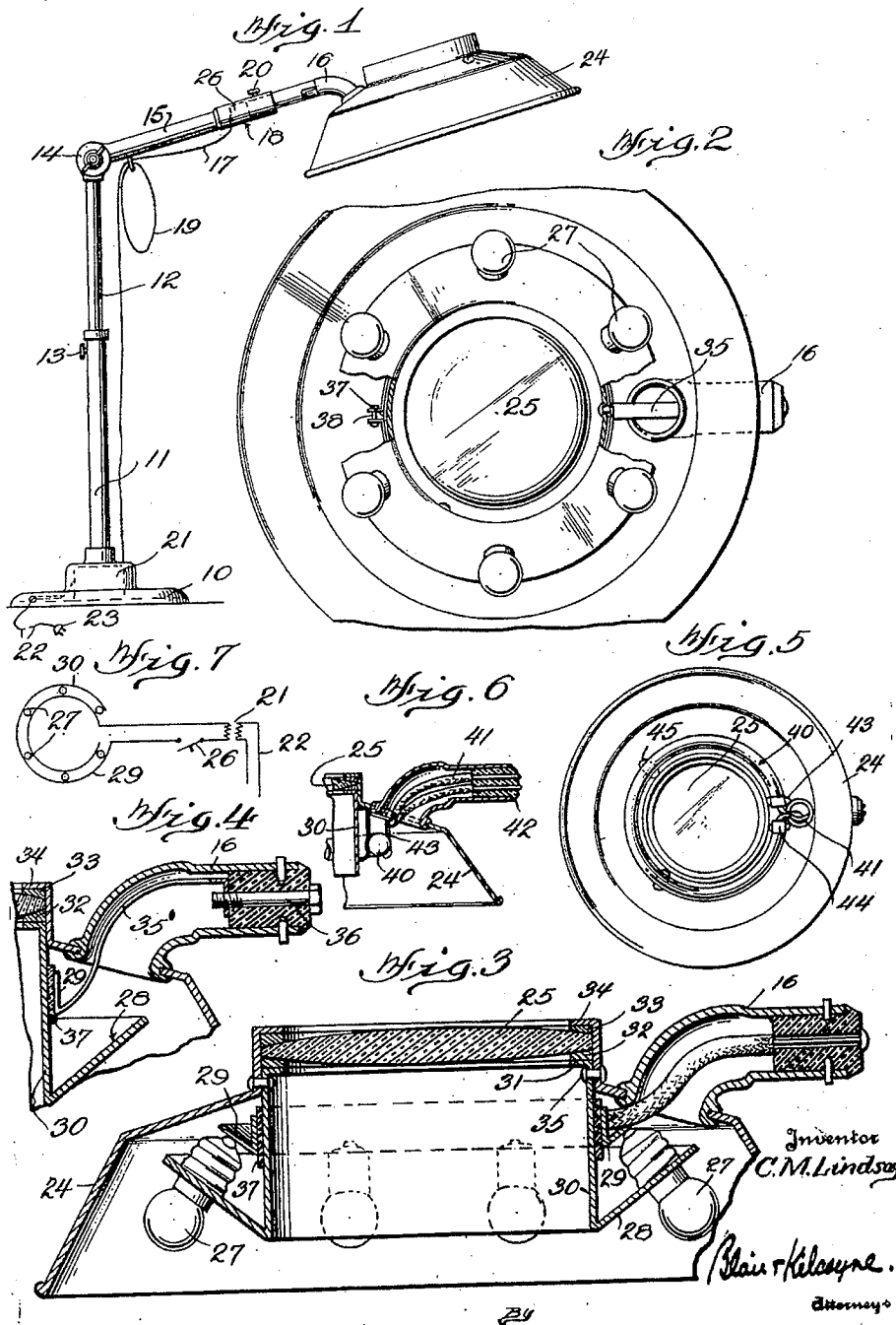
May 22, 1934.

C. MacH. LINDSAY

1,960,114

ILLUMINATING MAGNIFYING GLASS

Filed Nov. 12, 1931



Patented May 22, 1934

1,960,114

UNITED STATES PATENT OFFICE

1,960,114

ILLUMINATING MAGNIFYING GLASS

Charles MacHenry Lindsay, Washington, D. C.

Application November 12, 1931, Serial No. 574,647

10 Claims. (Cl. 88-39)

This invention relates to magnifying glasses and more particularly to small portable magnifying glasses having means associated therewith for illuminating the object, material, or surface to be examined through the glass. Besides forming a desirable reading glass, for example, it may be noted that the present invention is especially adapted for use by mechanics, watch makers, and artisans of various kinds where fine work is involved. In trying to read or work with the ordinary magnifying glasses, when the source of illumination is from above or to one side, the glare on the glass is annoying and tiring to the eyes. Precision mechanics when marking on irregular surfaces viewed through a magnifying glass such as watches, aviation instruments, or fine electrical windings, find that a strong light from one or two sources casts deep shadows on the objects viewed through the lens, frequently introducing errors in the work.

Other attempts to provide the illumination of objects viewed through lenses have been bulky, heavy and limited to one angle of illumination due to a limited source of current when small bulbs and batteries are used, or due to the size and weight of bulbs, sockets, etc. necessary when connected direct to standard lighting voltages.

It is accordingly one of the objects of the present invention to provide a simple and practical device of the above general character which is light and compact and which may be inexpensively manufactured and assembled.

A further object is to provide a device that will permit the illumination of an object viewed through a lens in such a manner that the light does not glare on the lens or into the eyes of the observer.

A further object is to provide means for illuminating an object, viewed through a lens, from a sufficient number of angles and of great enough light intensity to eliminate shadows, especially on objects having irregular surfaces.

A further object is to provide a device of the character described that will be light and compact, due to light weight and small size of bulbs and sockets, yet not be limited to battery operation as it can be attached to any convenient source of electric current.

A further object is to provide a device of the character described having a light reflector whose focal point will coincide with that of the lens.

A further object is to provide a device of the above character which may not only be set up in adjusted position with respect to the work with which it is used, but may also be considered as a

portable, self-contained device to be moved freely by hand from one position to another.

A further object is to provide a device of the above character in which the light from the illuminating means will be properly shielded from the eyes of the observer, as well as the surface of the lens.

Other objects will be in part obvious from the annexed drawing and in part hereinafter indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and in the unique relation of the members and in the relative proportioning and disposition thereof, all as more completely outlined herein.

To enable others skilled in the art to fully comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, a drawing depicting a preferred form of the invention has been annexed as a part of this disclosure, in which—

Fig. 1 is an elevation of the complete apparatus;

Fig. 2 is a detail inverted plan view of the glass and associated illuminating means;

Fig. 3 is a detail in section showing one form of reflector and mounting;

Fig. 4 is an enlarged detail sectional view showing the mounting of the lens and electrical connection;

Fig. 5 is an inverted plan showing a modification;

Fig. 6 is a detail sectional view showing the mounting and electrical connection of Fig. 5;

Fig. 7 is a diagrammatic representation of the electrical wiring arrangement of form shown in Fig. 2.

Referring now to the drawing in detail and more particularly to Fig. 1, 10 indicates a hollow base of any desired style, which may be mounted upon a floor or a desk, from which extends a tube 11 and a telescoping tube 12 adapted to be positioned at any desired height by adjusting means such as set screw 13. At the top of the element 12 is a flexible joint 14 for a projecting rod or tube 15 which may be set at any desired angle with respect to the tube 12.

The tube 15 is open at its upper end and is also slotted as at 18 on its under side, thereby to receive a handle 16 and associated electric cord 17, which latter may pass outwardly through the slot 18 to extension means such as loop 19. Holding means such as set screw 20 is provided to hold the handle 16, which carries a lens and reflector

2

1,960,114

as will be later apparent, in any desired adjusted position. It may be noted here that the electric cord or wire 17 preferably passes downwardly about the support 11 and through the base to a transformer or series resistance 21, thence by means of cord 22 to a socket plug 23. By this arrangement, the apparatus may be plugged into any suitable source of house current, with the transformer 21 stepping down the voltage to the amount desired for illuminating the small lights surrounding the glass in the form shown in Fig. 2 as will be hereinafter described.

The device shown in Fig. 3, which is the glass illustrated at the top of Fig. 1, comprises a substantially circular reflector 24 having an opening in its center in which is mounted a magnifying glass or lens 25. The handle 16 is arranged to extend from one side of the reflector 24 with its axis at right angles to the optical axis of the glass 25, whereby if desired the apparatus may be held in one hand while working with the other, for example. This handle 16 may be provided with a detachable switch 26 convenient for manipulation by the operator, thereby to energize the lights 27 which are arranged at a plurality of points, preferably six, and equi-distances from each other, around the lens 25. This arrangement of lights will illuminate the article or surface to be examined from all sides and prevent the casting of any shadows from one projecting part upon an adjacent portion.

The lights 27 are preferably small incandescent bulbs, such as are used in ordinary flash lights, which operate on a low voltage to reduce glare, and for that reason the transformer 21 is preferably provided. Obviously a storage battery or dry cells could be substituted and the transformer eliminated.

These lights or bulbs 27 are preferably screwed into sockets pressed or otherwise formed in an annular disc or support 28 of sheet metal. One lead from the cord 17 passes around the reflector as diagrammatically shown in Fig. 7 and is connected with one of the terminals of each light, while the opposite terminal or return lead is connected with the reflector 24, the reflector itself and associated metallic parts thus serving as the return circuit. Such an arrangement is permissible where relatively low voltages are utilized, and by arranging the lights in parallel with the return circuit formed by the reflector, a material reduction in the cost of manufacture and assembly of the parts results.

The support 28 may be formed integral with or secured to a substantially cylindrical sleeve 30 centrally mounted within the reflector 24, and serving as a light shield or barrier between the lights 27 and the lens or glass 25. The upper extremity of the sleeve 30 is provided with an inwardly turned flange 31, Fig. 3, to support a gasket or packing 32 of felt or the like which cooperates with the edge or periphery of lens 25. A second gasket 33 is provided on the upper surface of the lens and an inwardly turned flange 34 formed on the reflector is pressed downwardly thereon prior to permanently securing the parts in position as by means of rivets or screws 35. Such an arrangement is exceedingly simple and inexpensive.

The style of reflector shown in Fig. 5 is of conventional or well known design and with the sleeve or shield 30 provides an efficient reflecting surface. The reflector, however, may take any one of a number of desired forms. A convenient form of electrical assembly is shown in Fig. 4.

One common terminal 29 for the lights 27 is electrically connected by means of rigid conductor 35' passing up through handle 16 to a bolt 36 which acts as the central plug contact. This is insulated from other terminals 28 and 30 by an insulation band 37. This terminal 29 is of band form (Fig. 2) and clamps the insulation in place by adjusting bolt 38.

In Figs. 5 and 6 a modification is shown. Here instead of using flashlight bulbs of low voltage, a high voltage lamp 40 of the neon or other gas type is used. The color of the light may be varied accordingly. This lamp being of high voltage requires a modification of the transformer 21 and also in the electrical circuit at the handle. In other words, two leads 41 are connected at one end through socket plug 42 in a well known manner, while the other ends coact with clips 43 engaging the metallic ferrules 44 at the ends of the circular lamp bulb 40. One or more insulating clips 45 support the lamp 40 as necessary.

It is believed that the method of operation and use of the device herein described will be obvious to those familiar with the subject. It may be stated, however, that the complete apparatus is set up substantially as shown in Fig. 1 with the light or reflector turned towards the object or article to be examined. The switch 26 is operated to close the circuit between the source of supply and the lamps whereupon it will be seen that the object is brightly illuminated and all shadows eliminated by reason of the position of the light source. Likewise the shield 30 protects the eyes of the observer from any light emanating from the several bulbs. One may then loop through the lens 25 and see the surface or article under inspection not only magnified but free from shadows, and can work thereon as may be necessary with both hands. If desired, however, the handle 16 and associated lens and reflector may be removed from the standard shown in Fig. 1 and carried from one position to another to examine different sides of the piece of work as desired. In making the device, care should be used to proportion the parts whereby the focal points of the glass and reflector should coincide to obtain the greatest efficiency.

From the above it will be seen that the present invention contemplates a relatively simple, practical, and inexpensive apparatus well adapted to accomplish, among others, all of the objects and advantages herein set forth.

Without further analysis the foregoing will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore such adaptations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

I claim:

1. In a device of the character described, a reflector having a central opening, a shield member secured to and extending within the reflector and having an opening aligned axially with the opening of the reflector, a magnifying lens, cooperating means on the reflector and shield member providing a mounting for said lens, with the axis of the lens extending along the axis of said openings, and illuminating means disposed within the reflector and about the shield member with said

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shield member serving as a barrier between the illuminating means and said lens.

2. In a device of the character described, a reflector having a central opening, a shield member secured to and extending within the reflector and having an opening aligned axially with the opening of the reflector, a magnifying lens, cooperating means on the reflector and shield member providing a mounting for said lens, with the axis of the lens extending along the axis of said openings, the shield member being provided with means providing a support for illuminating means, and illuminating means mounted on said support, with the shield member serving as a barrier between the illuminating means and said lens.

3. In a device of the character described, a reflector having a central opening defined by a circular extension, a shield member secured to and disposed within the reflector having one end extending into said opening, said shield member being provided with an opening aligned axially with the reflector opening, a magnifying lens, cooperating means formed on the circular extension and on said end of the shield member providing a mounting for the lens with the axis of the lens extending along the axis of said openings, and illuminating means disposed within the reflector and about the shield member, with the shield member serving as a barrier between said illuminating means and the lens.

4. In a device of the character described, a reflector having a central opening defined by a circular extension, a shield member secured to and disposed within the reflector having one end extending into said opening, said shield member being provided with an opening aligned axially with the reflector opening, a magnifying lens, cooperating means formed on the circular extension and on said end of the shield member providing a mounting for the lens with the axis of the lens extending along the axis of said openings, the shield member being extended at its other end to provide a support for illuminating means, and illuminating means mounted on the support, with said shield member serving as a barrier between the illuminating means and said lens.

5. In a device of the character described, a reflector having a central opening defined by a circular extension having an inturned flange, a tubular shield member within the reflector and having an end extending into and secured to said extension, said end having an inturned flange, a magnifying lens, said inturned flanges providing a mounting for said lens, and illuminating means disposed within the reflector and about said shield member, with the shield member serving as a barrier between the illuminating means and the lens.

6. In a device of the character described, a reflector having a central opening defined by a circular extension having an inturned flange, a tubular shield member within the reflector and having an end extending into and secured to said extension, said end having an inturned

flange, a magnifying lens, said inturned flanges providing a mounting for said lens, said shield member having its other end extended to provide a support for illuminating means, and illuminating means mounted on said support, with the shield member serving as a barrier between the illuminating means and the lens.

7. In a device of the character described, a reflector having a central opening, a shield member secured to and extending within the reflector and having an opening aligned axially with the opening of the reflector, a magnifying lens, cooperating means on the reflector and on one end of said shield member providing a mounting for said lens, with the axis of the lens extending along the axis of said openings, a conductor disposed about the shield member, the shield member at its other end having an extension, lamp sockets formed in said extension, and lamps in said sockets electrically connected to said conductor.

8. In a device of the character described, a reflector having a central opening, a shield member secured to and extending within the reflector and having an opening aligned axially with the opening of the reflector, a magnifying lens, cooperating means on the reflector and on one end of said shield member providing a mounting for said lens, with the axis of the lens extending along the axis of said openings, a conductor disposed about the shield member at its other end having an extension, lamp sockets formed in said extension, lamps in said sockets electrically connected to said conductor, and a lead-in wire electrically connected to said conductor, with the reflector and associated metallic parts adapted to provide a return connection to a source of electrical energy.

9. In a device of the character described, the combination of a reflector having a central opening, a tubular shield member arranged within the reflector and having one end secured to the reflector adjacent the aforesaid opening, a magnifying lens, cooperating means on said reflector and shield member providing a mounting for said lens, low voltage lights within the reflector and carried by said shield member, connections between said lights and a source of electrical energy, and means for stepping down the voltage generated at said source to the voltage range of said lights.

10. In a device of the character described, a reflector having a central opening, a tubular shield member arranged within the reflector and having one end secured thereto adjacent the aforesaid opening, a magnifying lens, cooperating means on said reflector and shield member providing a mounting for said lens, the shield member being provided with an outwardly directed extension providing a support for illuminating means, illuminating means mounted on said support, and a handle on the reflector through which extend connections to said illuminating means from a source of electrical energy.

CHARLES MACHENRY LINDSAY.

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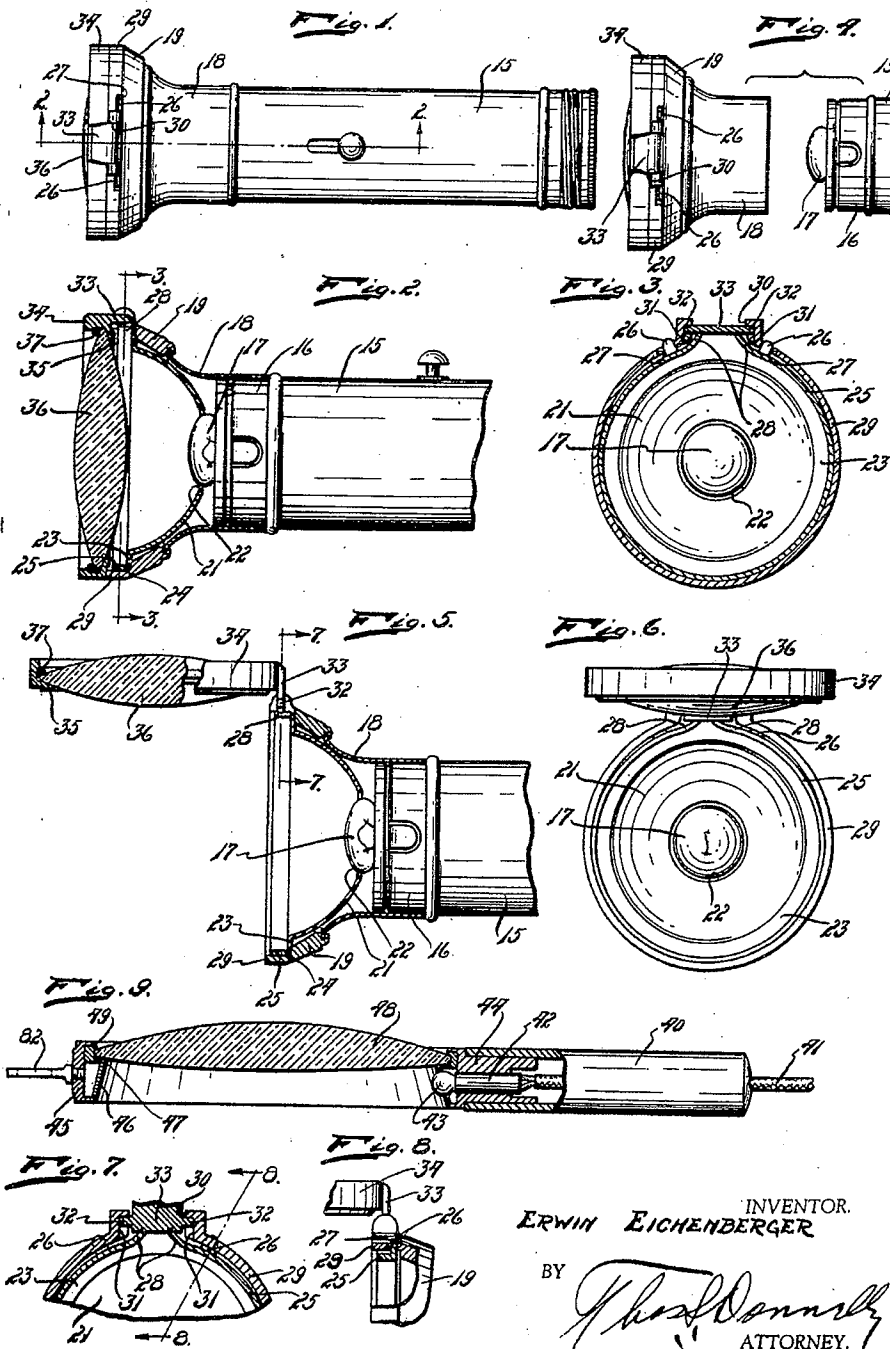
Oct. 31, 1939.

E. EICHENBERGER

2,178,371

COMBINATION FLASHLIGHT AND MAGNIFYING GLASS

Filed Sept. 8, 1937



INVENTOR.
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Patented Oct. 31, 1939

2,178,371

UNITED STATES PATENT OFFICE

2,178,371

COMBINATION FLASHLIGHT AND MAGNIFY-
ING GLASS

Erwin Eichenberger, Detroit, Mich.

Application September 8, 1937, Serial No. 162,914

5 Claims. (Cl. 88-40)

My invention relates to a new and useful improvement in a flashlight attachment and has for its object the provision of means whereby there may be brought into position at the forward end of a flashlight, a magnifying lens through which objects illuminated by the flashlight may be observed.

Another object of the invention is the provision of an attachment which may be easily and quickly mounted on a flashlight to provide the necessary structure for magnifying the object illuminated by the flashlight.

Another object of the invention is the provision of a mechanism whereby a magnifying lens may be used as a closure for the forward end of a flashlight and moved into position for magnifying objects which may be observed therethrough and which may be illuminated by the flashlight.

Another object of the invention is the provision in a flashlight of a novel reflecting member having a magnifying lens mounted thereon so that the object illuminated may be observed through the magnifying lens.

Other objects will appear hereinafter.

The invention consists in the combination and arrangement of parts hereinafter described and claimed and will be best understood by a reference to the accompanying drawing which forms a part of this specification and in which,

Fig. 1 is a side elevational view of a flashlight showing the invention applied.

Fig. 2 is a central vertical sectional view of the forward end of the flashlight taken on line 2-2 of Fig. 1.

Fig. 3 is a sectional view taken on line 3-3 of Fig. 2.

Fig. 4 is a side elevational view of the attachment showing it in separated relation to the flashlight which is shown in fragment.

Fig. 5 is a view similar to Fig. 2 illustrating the magnifying lens in position for magnifying purposes.

Fig. 6 is a front elevational view of the arrangement shown in Fig. 5.

Fig. 7 is a fragmentary sectional view taken on line 7-7 of Fig. 5.

Fig. 8 is a fragmentary sectional view taken on line 8-8 of Fig. 7.

Fig. 9 is a central longitudinal vertical sectional view of a modified form of structure.

In the drawing, I have illustrated the invention mounted on a flashlight having an elongated body portion 15 which serves as a hand grip and also serves as a casing for the batteries used to energize the light bulb 17 which projects outwardly

from the forward end 16 of the gripping portion 15. An attachment is mounted on the forward end 16 and comprises a sleeve 18 flaring outwardly toward its outer end and attached to the ring 19 which serves to complete the bell-mouth structure. Positioned within this bell-mouth structure is a semi-spherical reflector 21 having the central opening 22 into which the light bulb 17 projects. A marginal outwardly turned flange 23 is adapted to rest upon a shoulder 24 formed on the inner surface of the ring 19. A split resilient band 25 engages the flange 23 and serves to retain the reflector 21 in position. This band 25 is provided adjacent each of its ends with outwardly projecting lugs 26 which extend through the openings 27 formed in the axially directed portion 29 of the ring 19. The ends of the band 25 are angularly turned outwardly as at 28. The angularly turned ends 28 of the band 25 engage against the hinge plate 33 which is mounted on and extended axially of the closure ring 34. Projecting outwardly from this hinge plate 33 are the trunnions 32. The axially directed portion 29 is cut-away as at 30 and doubled upon itself to provide channels 31 in which the trunnions 32 engage. The construction is such that the ring 34 may be rocked on the trunnions 32 as an axis. The ends 28 of the band 25 engaging against the face of the hinge plate 33 when the ring 34 is moved into closing position as shown in Fig. 1 and Fig. 2. The pressure of the ends 28 of the band 25 against the hinge plate 33 serves to resist swingable movement of the ring 34 into the position shown in Fig. 5. However, when the ring 34 is swung into the position shown in Fig. 5, the ends 28 of the band 25 will then engage the end edge of the hinge plate 33 and tend to resist swingable movement of the ring 34 into closed position.

The ring 34 is provided at one edge with the inwardly projecting flange 35 against which rests the marginal portion of the magnifying lens 36. A split resilient ring 37 is snapped into the ring 34 and serves as a retainer for retaining the lens 36 in position. This spring 37, however, may be easily removed so that the removal and replacement of the lens 36 may be easily effected. When the sleeve 18 is slipped over the forward end 16 of the flashlight and the light bulb projected into the opening 22 formed in the reflector 21, the lens 36 will serve as a closure for the forward end of the bell construction or head and when in this position, the lens will serve to intensify the light emanating from the light bulb 17.

The invention affords a means for magnifying

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2,178,871

and illuminating an object at the same time. For instance in reading gas meters, electric meters and performing other similar work, it is often difficult to read the numbers or display matter when illuminated by the flashlight. In such instances, the ring 34 would be rocked to the position shown in Fig. 5 and the flashlight used in its usual manner to illuminate the matter to be observed. The operator could then observe the illuminated subject through the magnifying lens 36. Thus, there is combined in the one article an attachment which may be easily mounted on a flashlight and afford the combination of illumination and magnification. When it is desired to use the lens 36 for magnifying purposes as shown in Fig. 5, the ring 34 may be moved into the position shown in Fig. 2 and the lens 36 used not as a closure for the forward end of the flashlight.

In Fig. 9, I have shown a slightly modified form of the structure in which a rigid handle 40 is provided. Directed through this handle is the cable 41 leading from the batteries or source of electric energy, connected to the socket 42 in which the light bulb 43 is mounted. This socket 42 is mounted in a neck 44 which seats as a snug fit in the end of the handle 40. The neck 44 projects outwardly from a ring 45 formed from any suitable material such as fibrous composition, wood, metal or the like. Positioned in this ring 45 is a reflecting ring 46 formed conical and against which the light rays impinge and from which they are reflected downwardly onto the object which is positioned beneath this ring. This reflecting ring 46 is provided adjacent its upper end with a shoulder 47 on which rests a magnifying lens 48. The flange 49 being turned over the lens 48 and serving to retain it in position. In this form, the light rays emanating from the light bulb 43 are reflected by the inner surface of the conical ring 46 and concentrated on the object which is observed through the magnifying lens 48. Thus, there is combined in this structure a means for magnifying and illuminating the object to be observed. This structure, however, differs from the structure shown in Fig. 1 in that it is a departure from the ordinary flashlight construction and the lens is never used as a closure for a flashlight shell or gripping portion. A hook 52 is mounted on the ring 45 so that the device may be hung up at convenient places when desired.

With a construction such as illustrated, the flashlight is rendered adaptable for uses additional to that which is ordinarily inhered in a flashlight. At the same time, the device is one which may be economically manufactured and which is durable in structure and compact.

While I have illustrated and described the preferred form of construction I do not wish to limit myself to the precise details of structure shown but desire to avail myself of such variations and modifications as may come within the scope of the appended claims.

What I claim as new is:

1. A device of the class described adapted for attachment to a flashlight body, comprising: a sleeve-like structure adapted for seating over the end of a flashlight body in telescoping relation, the outer end of said sleeve being flared; a reflector mounted in the outer end of said sleeve and having a central opening formed therein for accommodating a light bulb; a swingable frame mounted on the outer end of said sleeve; a magnifying lens mounted in said frame and serving as a closure for the outer end of said sleeve, said

frame being swingable into position for extending said lens in a plane directed axially of said sleeve and positioned forwardly of said sleeve.

2. A device of the class described adapted for attachment to a flashlight body, comprising: a sleeve adapted for seating over the end of a flashlight body, the outer end of said sleeve being flared; a reflector mounted in said flared portion of said sleeve and having an opening formed therein for reception of a light bulb; an outwardly turned flange on said reflector; a shoulder formed on the inner side of said flared portion of said sleeve, said flange resting upon said shoulder; a split resilient band engaging in said flared portion and engaging said flange for retaining the same seated on said shoulder, the ends of said band being angularly turned and directed outwardly; a closure bearing frame swingably mounted on said flared portion, said ends of said band engaging a portion of said flange and resisting the swinging of said frame from one position to another; and a magnifying lens mounted in said frame and adapted, when in one position, for serving as a closure for the outer end of said sleeve and in another position for lying in a plane directed axially of said sleeve for magnifying objects observed therethrough while in the path of the rays from said bulb.

3. A device of the class described adapted for attachment to a flashlight body comprising, a sleeve adapted for mounting at one end in telescoping relation over the bulb bearing end of a flashlight body, the outer end of said sleeve being flared to provide a bell-like structure; a reflector mounted in the outer end of said sleeve; an outwardly turned flange on said reflector; a shoulder on the inner side of said sleeve, said flange resting on said shoulder, said sleeve terminating in an axially directed portion, there being a pair of spaced openings formed in said axially directed portion; a split resilient band positioned in said axially directed portion; a pair of lugs on said band, each of said lugs projecting through one of said openings, said band serving to retain said flange in position on said shoulder.

4. A device of the class described adapted for attachment to a flashlight body, comprising a sleeve adapted for mounting at one end in telescoping relation over the bulb bearing end of the flashlight, the outer end of said sleeve being flared to provide a bell-like structure; a reflector mounted in the outer end of said sleeve; an outwardly turned flange on said reflector; a shoulder on said outer end of said sleeve, said flange resting on said shoulder, said sleeve terminating in an axially directed portion, there being a pair of spaced openings formed in said axially directed portion; a split resilient band spring positioned in said axially directed portion; a pair of lugs on said band, each of said lugs projecting through one of said openings, said band serving to retain said flange in position on said shoulder; a closure bearing flange; a magnifying lens mounted in said frame to provide a closure; a hinge plate on said frame; a pair of trunnions on said hinge plate; a pair of channels formed on said axially directed portion for reception of said trunnions for mounting said frame swingably on said axially directed portion, the ends of said band being angularly turned and directed outwardly and engaging with the hinge plate and resisting swinging movement of said frame on its mountings, said frame when swung to one position serving as a closure for said sleeve and

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in another position for retaining said magnifying lens in position for magnifying illuminated objects observed therethrough.

5 5. A device of the class described adapted for attachment to a flashlight body, comprising: a sleeve like structure adapted for setting over the end of a flashlight body in telescoping relation, the outer end of said sleeve being flared; a reflector mounted in the outer end of said sleeve
10 and having a central opening formed therein for accommodating a light bulb; a swingable

frame mounted on the outer end of said sleeve; a magnifying lens mounted in said frame and serving as a closure for the outer end of said sleeve, said frame being swingable into position for extending said lens forwardly of said sleeve 5 at one side thereof and extended in a plane directed axially of said sleeve; and means cooperating with said frame and said sleeve for yieldingly resisting the swing of said frame when swung to light in said plane. 10

ERWIN EICHENBERGER.

Oct. 10, 1939.

E. W. PIKE

Des. 117,128

ILLUMINATED MAGNIFYING GLASS

Filed April 21, 1939

Fig. 1

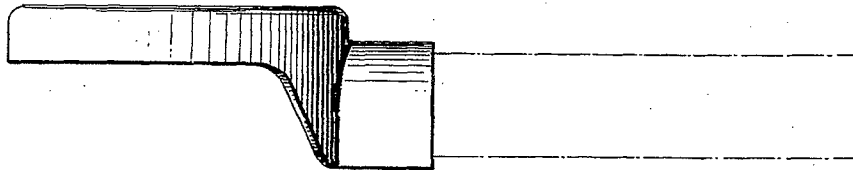


Fig. 2

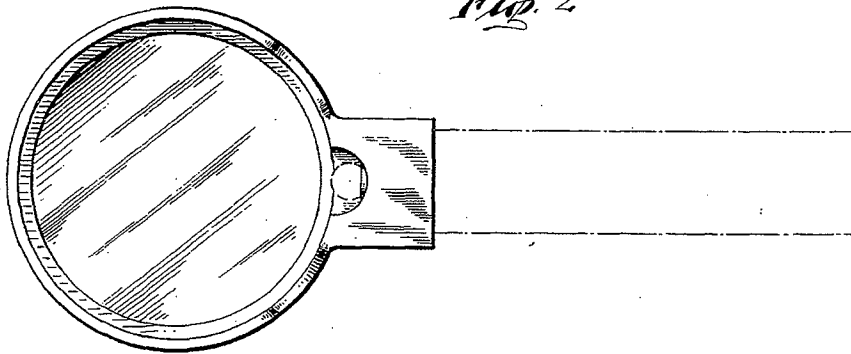


Fig. 3

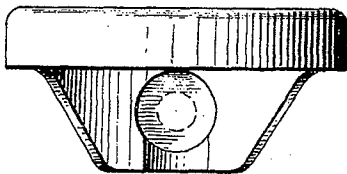
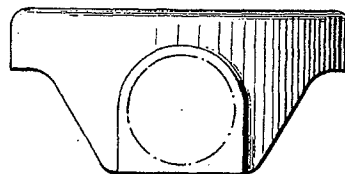


Fig. 4



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ATTORNEY

Patented Oct. 10, 1939

Des. 117,128

UNITED STATES PATENT OFFICE

117,128

DESIGN FOR AN ILLUMINATED MAGNIFY- ING GLASS

Eugene W. Pike, Elizabeth, N. J.

Application April 21, 1939, Serial No. 84,462

Term of patent 7 years

To all whom it may concern:

Be it known that I, Eugene W. Pike, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented a new, original, and ornamental Design for an Illuminated Magnifying Glass, of which the following is a specification, reference being had to the accompanying drawing, forming part thereof.

Fig. 1 is a side view of my new design for an illuminated magnifying glass;

Fig. 2 is a bottom plan view thereof;

Fig. 3 is a front view of such glass; and

Fig. 4 is a rear view of the same.

The dominant features of my design reside in the parts shown in full lines.

I claim:

The ornamental design for an illuminated magnifying glass, as shown and described.

EUGENE W. PIKE.